PATENT SPECIFICATION

NO DRAWINGS

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COMPLETE SPECIFICATION

Improvements in Surgical Dressings

We, AEROSAN LIMITED, a British Company, of 60, Friar Lane, Nottingham, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following Statement: —

This invention relates to the manufacture of surgical dressing for use on burns and wounds which are non-adherent to raw wound surfaces and are therefore easy to remove without causing damage to the delicate healing tissues and which also have an antibiotic or antibacterial action.

According to this invention, a surgical dressing comprises a textile material to which has been applied a composition prepared from the following ingredients, namely: —

(a) up to 5% by weight of a basic antibiotic and/or basic antibacterial substance;

(b) a quantity of a fatty acid (having ten to twenty carbon atoms) at least equivalent to the basic antibiotic and/or basic antibactrial substance and up to ten times said equivalent amount;

(c) from 5 to 20% by weight of a pharmaceutically acceptable fat, wax or oil of animal, vegetable, mineral or synthetic origin;

(d) a silicone fluid or grease and/or polyethylene glycol;

(e) from 10 to 20% by weight (with reference to component (c) of an emulsifying agent, and optionally

(f) from 1 to 5% by weight of a light innocuous powder and/or

(g) one or more other curative substances.

Specific compounds which are suitable as component (a) are the antibiotics: neomycin, tetracycline and its derivatives, polymyxin E and B, colistin and framycetin, and the antibacterial substances: dibromopropamidine, dequalinium acetate, benzalkonium chloride and chlorohexidine.

The fatty acid forming component (b) may be any fatty acid, or mixture of fatty acids, having from ten to twenty carbon atoms, examples being oleic acid, stearic acid, palmitic acid, myristic acid.

Component (c) may be liquid paraffin, soft paraffin, olive oil, arachis oil, almond oil, castor oil, linseed oil, or isopropyl myristate.

Component (d) may be a silicone oil or grease, such as Midland Silicone 500, a water-miscible silicone fluid such as L 30 (Union Carbide Corporation) or polyethylene glycol 400 (i.e. having a molecular weight of 400).

Component (e) may be one of the non-ionic emulsifying agents known under the registered Trade Marks "Polawax", "Cetomacrogol 1000", macrogol monostearate, "Crill 10" (Croda) or "Tween 60" (Atlas Powder Co).

Component (f) may be aluminium stearate or zinc stearate and serves to preserve the suspension during storage.

Component (g) may be cortisone or one of the derivatives of cortisone, such as hydrocortisone alcohol or acetate, these being advantageous because of their anti-inflammatory properties on burns and infected eczema.

The composition may be applied to a textile material by a number of methods, for example: —

Method A: An aqueous emulsion may be prepared by stirring components (b), (c), (d) and (e) and if desired components (f) and/or (g) into water and, while continuing stirring, adding component (a) slowly; textile material may then be padded with the resultant emulsion by conventional padding procedures and dried.

Method B: Textile material is padded with

an aqueous emulsion of components (b), (c), (d) and (e), excess emulsion is squeezed out and the material dried, for example at 80° to 90°C in a tenter and then passed through an aqueous solution of component (a), for example in the form of a salt such as neomycin sulphate, and again dried.

Method C: The two treatments in method B may be carried out in the reverse order.

Textile fabric which has had the desired components applied to it may be cut, packed and sterilised by ethylene oxide gas or in some other conventional manner and is then ready for use.

The textile material may be cotton, silk or rayon, including cellulose acetate rayon.

It has been found that for general use on burns, wounds and ulcers, a closely woven continuous filament rayon material of about 75 denier and a count of 80:60 or of 140 denier and a smaller count of about 70:48 is very suitable. Knitted fabric made from 55 denier cellulose acetate rayon or viscose rayon, having about 32 picks and 36 ends is also very suitable, being elastic and easier to apply over irregular contours. Cotton gauze with a count of 32:36 may also be used. Continuous filament rayon has the advantage over cotton that it does not linter and that it has a better non-adherent quality. The close texture referred to is preferred because, while allowing free discharge of exudate from the wound, it prevents growth of epithelium and granulation tissue through the interstices which is often one of the major causes of dressings becoming stuck to wounds. For severely septic burns and wounds which are discharging thick pus profusely, a dressing made from a more open material, such as standard medicinal gauze with a count of about 18:25, or leno gauze, or a rayon net having a wide mesh, may be used initially, being replaced by a dressing of a more closely woven or knitted fabric when the discharge has subsided and healing has commenced.

With cotton material it is advantageous to apply a thin film of a plastic material, for example cellulose acetate, for example by dipping it into a 6 to 8% solution of cellulose acetate in acetone which may also contain 10 to 25% of polyethylene glycol, to squeeze out the excess and allow the material to dry.

The following Examples (in which parts are by weight) give details of specific emulsions which may be used according to this invention. The ingredients may be applied to textile material by any of the methods described above.

EXAMPLE 1

	parts
Polyethylene glycol 400	5
Liquid paraffin	10
Oleic acid	2
"Polawax"	2
Zinc stearate	1
Neomycin sulphate	0.5
Water	to 100

The liquid paraffin may be replaced by a similar quantity of vegetable oil, such as arachis oil, almond oil castor oil or linseed oil.

The oleic acid may be replaced by another higher fatty acid, such as stearic acid or palmitic acid.

EXAMPLE 2

	parts
Liquid paraffin	15
Polyethylene glycol 400	5
Oleic acid	0.5
"Polawax"	2
Zinc stearate	1
Polymyxin B sulphate	0.1
Water	to 100

EXAMPLE 3

	parts
Olive oil	20
Palmitic acid	1
Polyethylene glycol 400	5
"Polawax"	2
Zinc stearate	1
Polymyxin B sulphate	0.2
Neomycin sulphate	0.5
Zinc bacitracin	0.1
Water	to 100

EXAMPLE 4

	parts
Soft paraffin	10
Myristic acid	2
Polyethylene glycol 400	5
"Polawax"	2
Aluminium stearate	2
Framycetin sulphate	1
Hydrocortisone acetate	1
Water	to 100

EXAMPLE 5

	parts
Liquid paraffin	10
Soft paraffin	5
Polyethylene glycol 400	5
Palmitic acid	1
"Polawax"	2
Silicone fluid	2
Dequalinium acetate	0.5
Water	to 100

EXAMPLE 6

	parts
Isopropyl myristate	15
Polyethylene glycol 400	5
Myristic acid	1.5
"Polawax"	3
Zinc stearate	2
Polymyxin sulphate	0.3
Neomycin sulphate	0.7
Hydrocortisone acetate	0.5
Water	to 100

EXAMPLE 7

	parts
Liquid paraffin	7.5
Soft paraffin	7.5
Polyethylene glycol 400	7.5
"Polawax"	3
Zinc stearate	1
Oleic acid	3
Chlorohexidine digluconate	2
Water	to 100

WHAT WE CLAIM IS:—

1. A surgical dressing comprising a textile material to which has been applied a composition prepared from the following ingredients, namely:
   (a) up to 5% by weight of a basic antibiotic and/or basic antibacterial substance;
   (b) a quantity of a fatty acid (having ten to twenty carbon atoms) at least equivalent to the basic antibiotic and/or basic antibacterial substance and up to ten times the equivalent amount;
   (c) from 5 to 20% of a pharmaceutically acceptable fat, wax or oil of animal, vegetable, mineral or synthetic origin;
   (d) a silicone fluid or grease and/or polyethylene glycol; and
   (e) from 10 to 20% (with reference to component (c)) of an emulsifying agent.

2. A surgical dressing a claimed in claim 1 in which the composition also contains:
   (f) from 1 to 5% of a light innocuous powder.

3. A surgical dressing as claimed in claim 1 or 2 in which the composition also contains:
   (g) one or more other curative substances.

4. A surgical dressing as claimed in any of claims 1 to 3 in which component (a) is one or more of the substances neomycin, tetracycline, polymyxin E, polymyxin B, colistin, framycetin, dibromopropamidine, dequalinium acetate, benzalkonium chloride and chlorohexidine.

5. A surgical dressing as claimed in any of claims 1 to 4 in which component (b) is a mixture of fatty acids having from ten to twenty carbon atoms.

6. A surgical dressing as claimed in any of claims 1 to 5 in which component (b) is one or more of the fatty acids: oleic acid, stearic acid, palmitic acid or myristic acid.

7. A surgical dressing as claimed in any of claims 1 to 6 in which component (c) is one or more of the substances: liquid paraffin, soft paraffin, olive oil, arachis oil, almond oil, castor oil, linseed oil and isopropyl myristate.

8. A surgical dressing as claimed in any of claims 1 to 7 in which component (d) is a silicone oil or grease or a water-miscible silicone fluid, or polyethylene glycol.

9. A surgical dressing as claimed in any of claims 1 to 8 in which component (e) is a non-ionic emulsifying agent.

10. A surgical dressing as claimed in any of claims 2 to 9 in which component (f) is aluminium stearate or zinc stearate.

11. A surgical dressing as claimed in any of claims 3 to 10 in which component (g) is cortisone or a derivative of cortisone.

12. A surgical dressing comprising a textile material to which has been applied one of the compositions specified in the foregoing Examples.

13. A process for the production of a surgical dressing which comprises preparing an aqueous emulsion of components (b), (c), (d) and (e), and if desired components (f) and/or (g) as set out in any of claims 1 to 12, adding component (a) as set out in any of claims 1 to 12 slowly, padding the resulant emulsion onto the textile material and drying the material.

14. A process for the production of a surgical dressing wherein textile material is padded with an aqueous emulsion of components (b), (c), (d) and (e) as set out in any of claims 1 to 12, excess emulsion is squeezed out, the material is dried, then passed through an aqueous solution of component (a) as set out in any of claims 1 to 12 and again dried.

15. A process for the production of a surgical dressing wherein textile material is passed through an aqueous solution of component (a), squeezed and dried, then padded with an aqueous emulsion of components (b), (c), (d) and (e) (all as set out in any of claims 1 to 12 and again dried.

16. A surgical dressing as claimed in any of claims 1 to 12 wherein the textile material is made of rayon.

17. A surgical dressing as claimed in any of claims 1 to 12 wherein the textile material is made of cellulose acetate rayon.

18. A surgical dressing as claimed in any of claims 1 to 12 wherein the textile material is made of cotton which has been coated with cellulose acetate.

19. A surgical dressing as claimed in any of claims 1 to 12 wherein the textile material is made of cotton.

20. A surgical dressing as claimed in any of claims 1 to 12 wherein the textile material is made of silk.

21. A process as claimed in any of claims 13 to 15 wherein the textile material is made of rayon.

22. A process as claimed in any of claims 13 to 15 wherein the textile material is made of cellulose acetate rayon.

23. A process as claimed in any of claims 13 to 15 wherein the textile material is made of cotton which has been coated with cellulose acetate.

24. A process as claimed in any of claims 13 to 15 wherein the textile material is made of cotton.

25. A process as claimed in any of claims 13 to 15 wherein the textile material is made of silk.

26. A process as claimed in any of claims 13 to 15 or 21 to 25 carried out with the ingredients specified in any of the foregoing Examples.

27. Surgical dressings when obtained by the process claimed in any of claims 13 to 15 or 21 to 26.

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